

AbstractID: 2289 Title: Overcoming a Fundamental Display Limitation: The Mouse-Less Visual Cursor

The 8-bit limitation of displays presents a major problem for displaying digital images. The familiar techniques of window and level manipulation are currently used to deal with this limitation. However, finding a window-level setting that is optimal for the entire image is generally impossible unless the image has a uniform background. This paper presents an alternative approach involving a 'mouse-less visual cursor' that tracks the eye-movements of the observer and enhances a small region centered on the gaze-point. We used an ASL-5000 eye-tracking system to determine the gaze-point. The real-time gaze-point data was analyzed in real-time by an algorithm that made a decision whether or not to turn on the enhanced window. We have also developed a technique to assess the efficacy of this algorithm and have compared it to the offline-algorithm developed by ASL. We found that our real-time algorithm performs quite well compared to the ASL offline algorithm. We have also conducted a preliminary observer test of the system using simulated lesions superposed on mammograms. The technology needs further development but we believe that this method is a very promising way of overcoming a fundamental limitation of displays.